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like circles, parabolas, &c., are similar curves; tables constructed for one value of the parameter apply to all by simple proportion.

He then enters into an analytical investigation of the equations suited for his purpose, and finally concludes his paper with four tables. The first consists of six columns, and contains corresponding values of the parameter; the exponential function or inverse logarithm of the span, divided by the parameter; the versed sine, the length, the tension at the point of support, and the angle of suspension;—all computed for a semi-span of 100 parts, for the ordinary catenary, and for a parameter varying from 1000 to 2000.

Table 2. contains the same quantities for a constant parameter 100, and for all values of the semi-span from 1 to 100.

Table 3. is adapted to the catenary of equal strength, and corresponds to Table 1. in the ordinary catenary; the constant span being 100, and the parameter varying from 70 to 1000, with an additional column expressing the weight of the whole curve; while Table 4. exhibits the same things for this curve, arranged in the order of Table 2.

By the aid of these Tables all the requisite particulars may easily be found in any case proposed in practice.

On Magnetic Influence in the Solar Rays. By Samuel Hunter Christie, Esq. M.A. F.R.S. of Trinity College, Cambridge; Fellow of the Cambridge Philosophical Society: of the Royal Military Academy. Communicated November 15, 1825. Read January 19, 1826. [*Phil. Trans.* 1826, Part III. p. 219.]

The object of this communication is to show, by a series of experiments, that the sun's rays possess sensible magnetic properties, which are observable in the vibrations of a magnetic needle exposed to them independent of their heating effect; and also to point out the changes which take place in the intensity of a needle's magnetism, from changes of temperature, as deduced from its times of vibration.

The main fact noticed by the author, indicative of a magnetic influence in the solar rays, is this;—that a magnetic needle vibrating, exposed to the rays of the sun, comes to rest more quickly than when vibrating in the shade.

A needle, six inches long, contained in a brass compass-box with a glass cover, was suspended by a fine hair, and made to vibrate, alternately shaded and exposed to the sun. The shade was produced by a wooden screen, supported four feet above the box. It was then found that (setting off from the same point,) the 100th vibration could be very distinctly noted in the shade, but none further than the 75th in the sun. So far, too, from the increase of temperature in the needle having caused the vibrations to be performed slower in the latter case, they were actually executed somewhat more rapidly.

In another experiment a heavier needle was suspended by a fine wire, and when heated by exposure to the sun its decrease of intensity was ascertained by torsion of the wire, and was found to correspond nearly with the author's previous determinations; but the terminal arc, after fifty vibrations made in the sun, was found always considerably less than after the same number in the shade, the initial arcs being the same in both cases. Other observations made in strong sunshine, and of which a detail is given, led to the same conclusions; the terminal arc in the shade, after forty vibrations, being 14° , and in the sun only $8\frac{1}{2}$, the initial arc being 90° .

That this effect does not arise from change of temperature and intensity in the needle is evident from the observations themselves. To show that it does not arise from change of temperature in the brass box, the author heated the box over a fire till its heat was barely supportable by the hand; and the needle being vibrated alternately in the box so heated, and in the cold box (but in neither case exposed to the sun), the effect of increased temperature was found decidedly and considerably the reverse of that of the solar radiation, the terminal arc being materially increased by the heat,—a circumstance, he thinks, indicative of a diminished capacity for magnetism in brass at an elevated temperature.

The author next tried the effect of an elevation of temperature in the needle itself, by dipping it in boiling water, but found no sensible effect on the terminal arc.

The small accelerations in the times of vibrations in the experiments first described, the author attributes to the diminution of the arcs. The first observations in which the peculiar effect was noticed were made June 4, 1824; and he regrets that his absence from home during the hot and clear weather of the summer of 1825, prevented his extending the inquiry by further and obvious experiments. Meanwhile he regards these observations as tending considerably to remove the doubts raised respecting the influence of the violet ray in Professor Morichini's experiments, arising from their repeated failures in the ablest hands.

On the mutual Action of Sulphuric Acid and Alcohol, with Observations on the Composition and Properties of the resulting Compound. By Mr. Henry Hennell, Chemical Operator at Apothecaries' Hall. Communicated by W. T. Brande, Esq. Sec. R.S. Read March 9, 1826. [Phil. Trans. 1826, Part III. p. 240.]

At the commencement of this paper Mr. Hennell describes certain peculiarities in the properties of oil of wine, which induced him to consider sulphuric acid as one of its proximate elements; and on following up his analytical experiments upon it he found that about 37 per cent. of that acid might be obtained during its decomposition, although in its original state it affords no indications of that acid by the tests of the soluble salts of baryta,—a circumstance which he refers to the presence of hydrocarbon exerting a peculiar saturating